

The invention claimed is:

1. A continuously variable transmission comprising a rotary input shaft, a rotary output shaft and a drive train unit between the input and output shafts, the drive train unit including adjuster means for continuously varying a ratio of input shaft speed to output shaft speed, and regulator means for regulating the output shaft speed to be substantially constant at a given substantially constant input speed, characterized in that the regulator means includes an orbital wheel being adapted to transmit power from an output element located eccentrically thereon.
2. A transmission as claimed in claim 1, in which the orbital wheel is driven in an orbit around an interior periphery of an internal wheel.
3. A transmission as claimed in claim 2, in which the orbital wheel is further driven by an idler wheel.
4. A transmission as claimed in claim 2, in which the orbital wheel is directly driven by engagement with the interior periphery of the internal wheel.
5. A transmission as claimed in claim 2, in which the orbital wheel has one-third of a radius of the internal wheel.
6. A transmission as claimed in claim 1, in which the output element is located from  $0.05R$  to  $0.25R$  from a center of the orbital wheel, where  $R$  is a distance from the center of the orbital wheel to a center of a circular orbiting motion thereof.
7. A transmission as claimed claim 2, in which each said wheel comprises a toothed gear.

8. A transmission as claimed in claim 1, in which the output element is adapted to reciprocate a drive rod via a slot, the regulator means regulating the drive rod to move with a cycle having a portion of substantially constant speed linear motion.
9. A transmission as claimed in claim 8, in which the slot is substantially perpendicular to a direction of reciprocation of the rod.
10. A transmission as claimed in claim 8, in which the regulator means includes a non-linear contour formed in the slot.
11. A continuously variable transmission comprising a rotary input shaft, a rotary output shaft and a drive train unit between the input shaft and output shaft, the drive train unit including adjuster means for continuously varying the ratio of input shaft speed to output shaft speed, characterized in that the adjuster means is passively operable whereby ratio change may be provided without actively driving the output shaft upon an input adjustment to the adjuster means.
12. A transmission as claimed in claim 11, in which the adjuster means includes a lost motion device enabling motion of an input adjuster of the adjuster means to be lost during a driving mode of the drive train unit.
13. A transmission as claimed in claim 12, in which the lost motion device includes a spring bias, the spring bias being arranged to recover lost motion during a non-driving mode of the drive train unit for changing a transmission ratio.
14. A transmission as claimed in claim 8, in which the adjuster means includes an arcuate member having one point thereon driven by the drive rod for selectively pivoting the arcuate member about a pivot point.

15. A transmission as claimed in claim 14, in which the adjuster means includes means for moving a pivot point for varying a ratio of input shaft speed to output speed of the transmission.
16. A transmission as claimed in claim 14, in which an output rod is provided with one point thereon adapted to be selectively driven by the arcuate member.
17. A transmission as claimed in claim 16, in which the output rod is adapted to drive the output shaft via a unidirectional coupling.
18. A transmission as claimed in claim 11, which includes six said drive train units operating at 60° steps out of phase with one another.
19. A transmission as claimed in claim 1, which includes three or more said drive train units operating at equal angular steps out of phase with one another.
20. A transmission as claimed in claim 11, in which the adjuster means is arranged to be operable to a 1:0 input to output shaft speed ratio.
21. A transmission as claimed in claim 1, in which the adjuster means is arranged to be operable to above a 1:1 input to output speed ratio with output speed higher than input speed.
22. A continuously variable transmission comprising a rotary input shaft, a rotary output shaft and a drive train unit between the input shaft and output shaft, a drive train unit including adjuster means for continuously varying the ratio of input shaft speed to output shaft speed, and a regulator means for regulating output shaft speed to be substantially constant at a given substantially constant input shaft speed, characterized in that the regulator means includes an orbital wheel adapted to reciprocate a linearly slidable rod via a slot, the slot having a non-

linear contour for regulating the rod to move with a cycle having a portion of substantially constant speed linear motion.

23. A transmission as claimed in claim 22, including a controller for controlling the adjuster means to maintain output shaft speed constant upon variance of input shaft speed.